

# ECO-DESIGN OF REFRACTORIES

## E FOR ECOLOGICAL, ECONOMIC, ECO-ENERGETIC

### FIRE - ECerS SUMMER SCHOOL FOR STUDENTS AND INDUSTRIALISTS

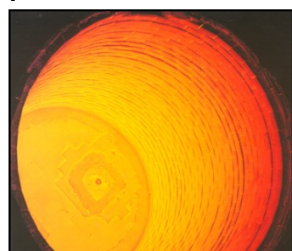
AACHEN, Germany - Tuesday 28<sup>th</sup> to Thursday 30<sup>th</sup> June 2022

#### WELCOME TO AACHEN (GERMANY)

It is a great pleasure to invite you to take part to the 2022 FIRE-ECerS Summer School: Eco-Design of Refractories which will be held at the RWTH Aachen University, Germany from June 28<sup>th</sup> to June 29<sup>th</sup>. A visit of Tata Steel plant in Ijmuiden, The Netherlands is planned on June 30<sup>th</sup>.



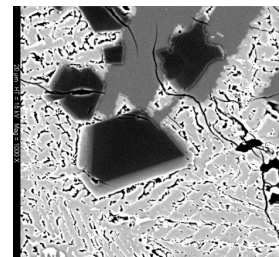
This Summer School aims to promote cooperation on educational programs in refractories among the major institutions and companies of the sector. This school will favour networking between young scientists and experienced professors and experts. It will create links between different scientific communities (ceramics, refractory manufacturers, metallurgy, mechanics, thermodynamics, instrumentation, sustainable development) and between industrial and academic research.



#### FACE TO FACE AND VIRTUAL TRAINING COURSE

**Integrating 3 aspects :** fundamental approach, industrial needs, new approaches on innovations

**Proposing a good balance between :** the courses, an industrial tour, exchanges and conviviality



#### CONTACT

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#### SPONSORS



#### MORE INFORMATION :

[https://ecers.org/news/146/419/0622-FIRE-ECerS-SUMMER-SCHOOL/d.ceramic\\_details\\_conferences](https://ecers.org/news/146/419/0622-FIRE-ECerS-SUMMER-SCHOOL/d.ceramic_details_conferences)

#### REGISTRATION:

On line EcerS web side  
Deadline for registration: 15/05/2022



Venue: SuperC Building  
RWTH Aachen University  
Templergraben 57  
52062 Aachen



Visit of Tata Steel Plant

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## PROGRAM

### TUESDAY, JUNE 28TH

#### **Refresher of basic knowledge**

- Raw materials
- Shaped refractories
- Monolithic refractories : LCC, ULCC, NCC

#### **The Fundamentals : Corrosion and thermo-mechanics**

- Thermodynamic and kinetics
- Reactive transportation
- Fracture and creep

#### **Exhibition Cerami<sup>o</sup>k**

#### **Poster session and video session**

#### **Banquet**

### WEDNESDAY, JUNE 29TH

#### **Industrial and economic needs**

- Refractory values in use
- How to innovate ?

#### **Future challenges for refractories**

- Sensors, instrumentation and refractory needs
- Challenges for data mining and machine learning in the refractory industry and end-users
- Circular economy

#### **Refractories for Steel Making**

- Critical wear factors and optimum choice
- Improvement of steel cleanliness

### DEPARTURE TO IJMUIDEN

### THURSDAY, JUNE 30TH

#### **Refractories for Steel Making**

- The new face of the steel industry
- Management and production of iron by H<sub>2</sub> – consequences for refractories

#### **Visit of Tata Steel Plant**

#### **Discussion, Brain Storming**

#### **End of the FIRE-ECERS School (16h30)**

### LECTURERS

- Dr. Andus Buhr – ALMATIS, Germany
- Dr. Erwan Guéguen – RHI MAGNESITA, Austria
- Dr. Bruno Touzo – CALDERYS, France
- Dr. Hong Peng – ELKEM, Norway
- Prof. In-Ho Jung – Seoul National University, South Korea
- Dr. Thorsten Tonnesen – RWTH Aachen University, Germany
- Prof. Harald Harmuth, Dr. Dietmar Gruber, Dr. Shengli Jin – Montanuniversität Leoben, Austria
- Dr. Chris Parr – Imerys, France
- Dr. Christoph Wöhrmeyer – Imerys, Germany
- Prof. Jacques Poirier and Prof. Emmanuel de Bilbao – Cemhti / University of Orléans, France
- Dr. Philippe Blumenfeld – Refractory expert – formerly ArcelorMittal
- Matheus Santos and Prof. Victor C. Pandolfelli – Universidade Federal de São Carlos, Brazil
- Dr. Carmen Baudín – Instituto de Cerámica y Vidrio, CSIC, Spain
- Margarita Alvarez – Alfran, Spain
- Prof. Christos Aneziris – University of Freiberg, Germany
- Dr. Paul van Beurden – Tata Steel, The Netherlands

**THE TRAINING COURSES AND  
CONFERENCES WILL BE MEMORIZED  
USING VIDEO DOCUMENTS!**